



Bilkent University

CS-224 Lab 6

Lab Work

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Course: CS 224

Section: 1

Lab No: 6

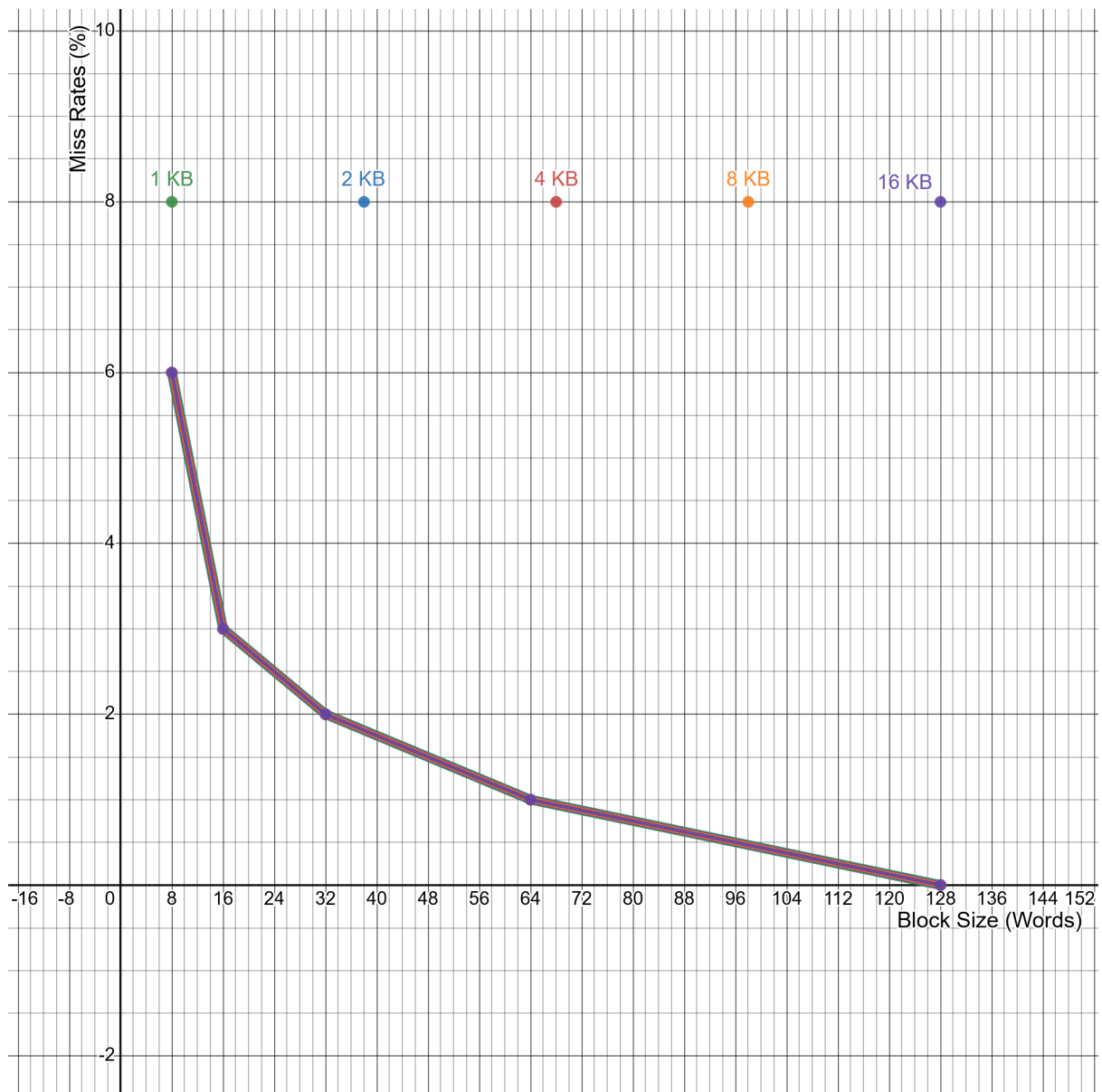
Date: 14/12/2022

2.a (N = 128)

Block Size (Words)	8	16	32	64	128
Cache Size (Kilobytes)					
1 KB	Miss Rate %6 Miss Number 1039	Miss Rate %3 Miss Number 523	Miss Rate %2 Miss Number 264	Miss Rate %1 Miss Number 134	Miss Rate %0 Miss Number 70
2 KB	Miss Rate %6 Miss Number 1039	Miss Rate %3 Miss Number 523	Miss Rate %2 Miss Number 264	Miss Rate %1 Miss Number 134	Miss Rate %0 Miss Number 69
4 KB	Miss Rate %6 Miss Number 1039	Miss Rate %3 Miss Number 523	Miss Rate %2 Miss Number 264	Miss Rate %1 Miss Number 134	Miss Rate %0 Miss Number 69
8 KB	Miss Rate %6 Miss Number 1039	Miss Rate %3 Miss Number 523	Miss Rate %2 Miss Number 264	Miss Rate %1 Miss Number 134	Miss Rate %0 Miss Number 69
16 KB	Miss Rate %6 Miss Number 1039	Miss Rate %3 Miss Number 523	Miss Rate %2 Miss Number 264	Miss Rate %1 Miss Number 134	Miss Rate %0 Miss Number 69

Table 1: Direct Mapped Cache - Row Major Summation Miss Rates (N = 128)

2.a (N = 128)



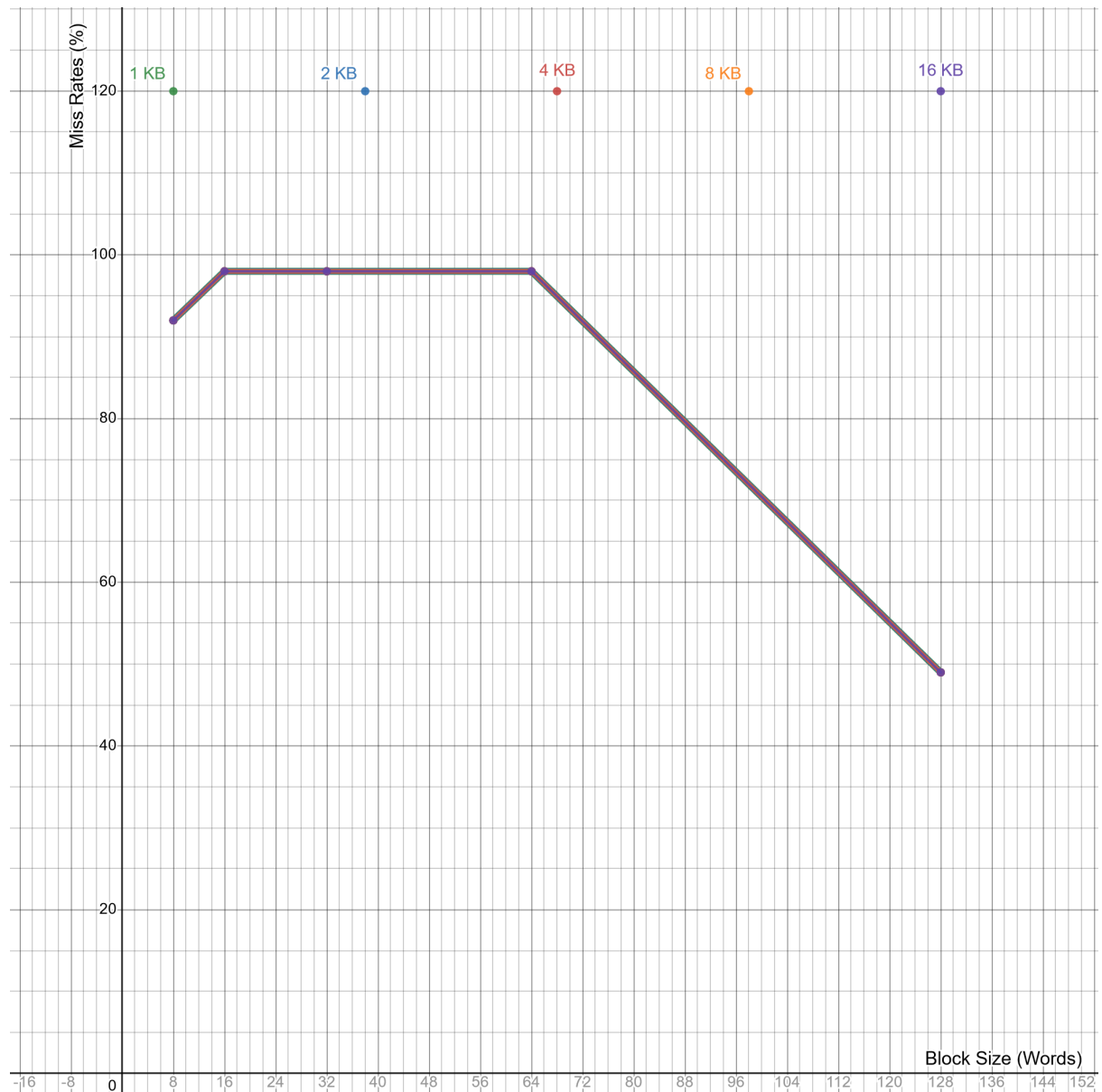
Graph 1: Direct Mapped Cache - Row Major Summation Miss Rates (N = 128)

2.a (N = 128)

Block Size (Words)	8	16	32	64	128
Cache Size (Kilobytes)					
1 KB	Miss Rate %98 Miss Number 16399	Miss Rate %98 Miss Number 16395	Miss Rate %98 Miss Number 16392	Miss Rate %98 Miss Number 16390	Miss Rate %49 Miss Number 8198
2 KB	Miss Rate %98 Miss Number 16399	Miss Rate %98 Miss Number 16395	Miss Rate %98 Miss Number 16392	Miss Rate %98 Miss Number 16390	Miss Rate %49 Miss Number 8198
4 KB	Miss Rate %98 Miss Number 16399	Miss Rate %98 Miss Number 16395	Miss Rate %98 Miss Number 16392	Miss Rate %98 Miss Number 16390	Miss Rate %49 Miss Number 8198
8 KB	Miss Rate %98 Miss Number 16399	Miss Rate %98 Miss Number 16395	Miss Rate %98 Miss Number 16392	Miss Rate %98 Miss Number 16390	Miss Rate %49 Miss Number 8198
16 KB	Miss Rate %98 Miss Number 16399	Miss Rate %98 Miss Number 16395	Miss Rate %98 Miss Number 16392	Miss Rate %98 Miss Number 16390	Miss Rate %49 Miss Number 8198

Table 2: Direct Mapped Cache - Column Major Summation Miss Rates (N = 128)

2.a (N = 128)



Graph 2: Direct Mapped Cache - Column Major Summation Miss Rates(N = 128)

2.b (N = 128)

	Hit Rate: Good Cache Size: 4 KB Block Size: 128 Words	Hit Rate: Medium Cache Size: 4 KB Block Size: 16 Words	Hit Rate: Poor Cache Size: 4 KB Block Size: 8 Words
Direct Mapped	Miss Rate: %49 Miss Number: 8198	Miss Rate: %98 Miss Number: 16395	Miss Rate: %92 Miss Number: 16399
Fully Associative (LRU)	Miss Rate: %49 Miss Number: 8197	Miss Rate: %98 Miss Number: 16395	Miss Rate: %6 Miss Number: 1039
Fully Associative (Random)	Miss Rate: %49 Miss Number: 8197	Miss Rate: %80 Miss Number: 13291	Miss Rate: %19 Miss Number: 3176

Table 3: Column Major Summation Miss Rates with Cache Designs (N = 128)

2.c (N = 128)

	Hit Rate: Good Cache Size: 8 KB Block Size: 128 Words	Hit Rate: Medium Cache Size: 8 KB Block Size: 16 Words	Hit Rate: Poor Cache Size: 8 KB Block Size: 8 Words
Set Size			
8	Miss Rate: %49 Miss Number: 8197	Miss Rate: %98 Miss Number: 16395	Miss Rate: %98 Miss Number: 16399
16	Miss Rate: %49 Miss Number: 8197	Miss Rate: %98 Miss Number: 16395	Miss Rate: %98 Miss Number: 16399
32	Miss Rate: %49 Miss Number: 8197	Miss Rate: %98 Miss Number: 16395	Miss Rate: %98 Miss Number: 16399

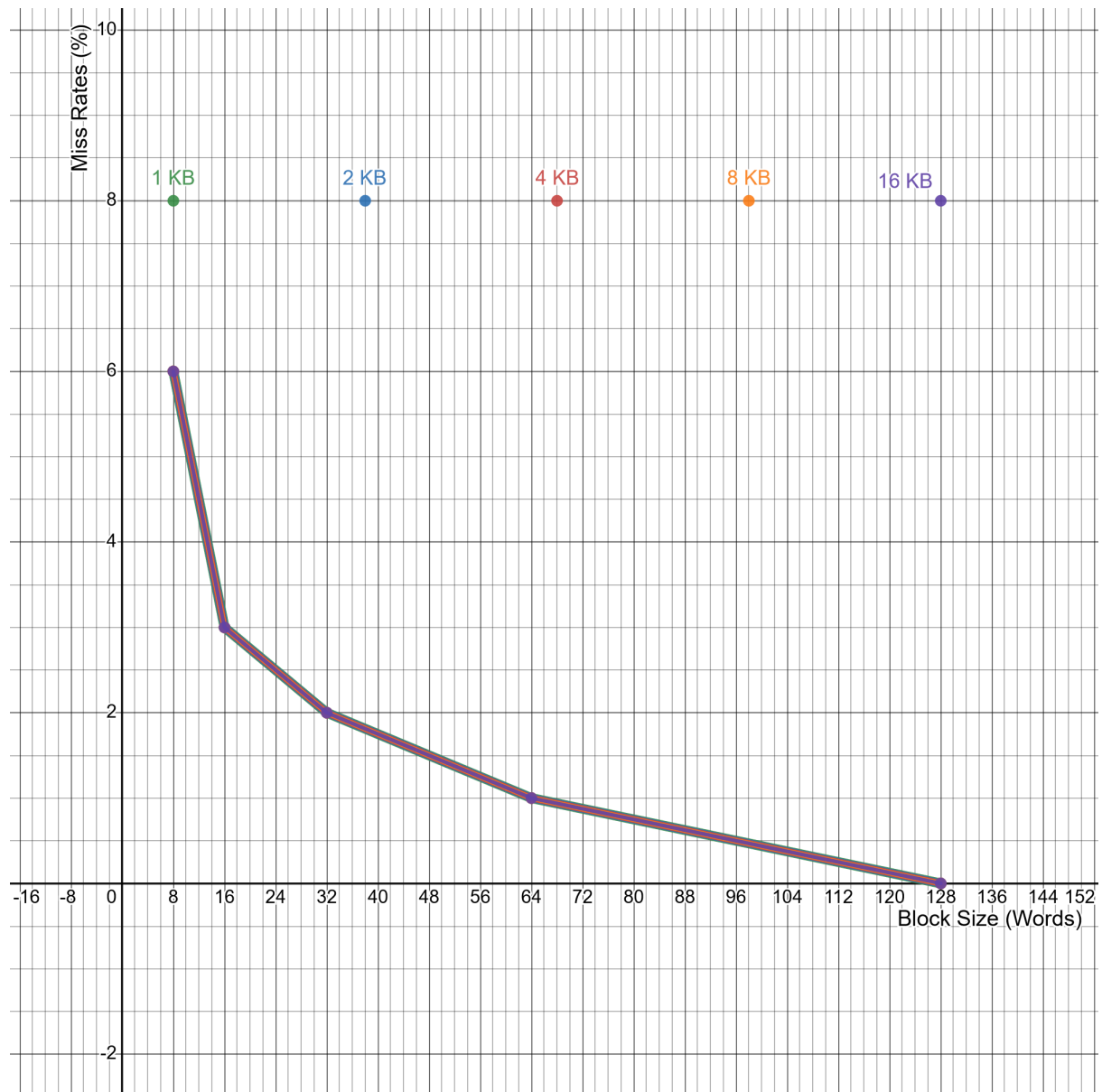
Table 4: Column Major Summation Miss Rates for N-Way Caches (N = 128)

2.a (N = 64)

Block Size (Words)	8	16	32	64	128
Cache Size (Kilobytes)					
1 KB	Miss Rate %6 Miss Number 271	Miss Rate %3 Miss Number 139	Miss Rate %2 Miss Number 72	Miss Rate %1 Miss Number 38	Miss Rate %1 Miss Number 22
2 KB	Miss Rate %6 Miss Number 271	Miss Rate %3 Miss Number 139	Miss Rate %2 Miss Number 72	Miss Rate %1 Miss Number 38	Miss Rate %0 Miss Number 21
4 KB	Miss Rate %6 Miss Number 271	Miss Rate %3 Miss Number 139	Miss Rate %2 Miss Number 72	Miss Rate %1 Miss Number 38	Miss Rate %0 Miss Number 21
8 KB	Miss Rate %6 Miss Number 271	Miss Rate %3 Miss Number 139	Miss Rate %2 Miss Number 72	Miss Rate %1 Miss Number 38	Miss Rate %0 Miss Number 21
16 KB	Miss Rate %6 Miss Number 270	Miss Rate %3 Miss Number 138	Miss Rate %2 Miss Number 71	Miss Rate %1 Miss Number 37	Miss Rate %0 Miss Number 20

Table 5: Direct Mapped Cache - Row Major Summation Miss Rates (N = 64)

2.a (N = 64)



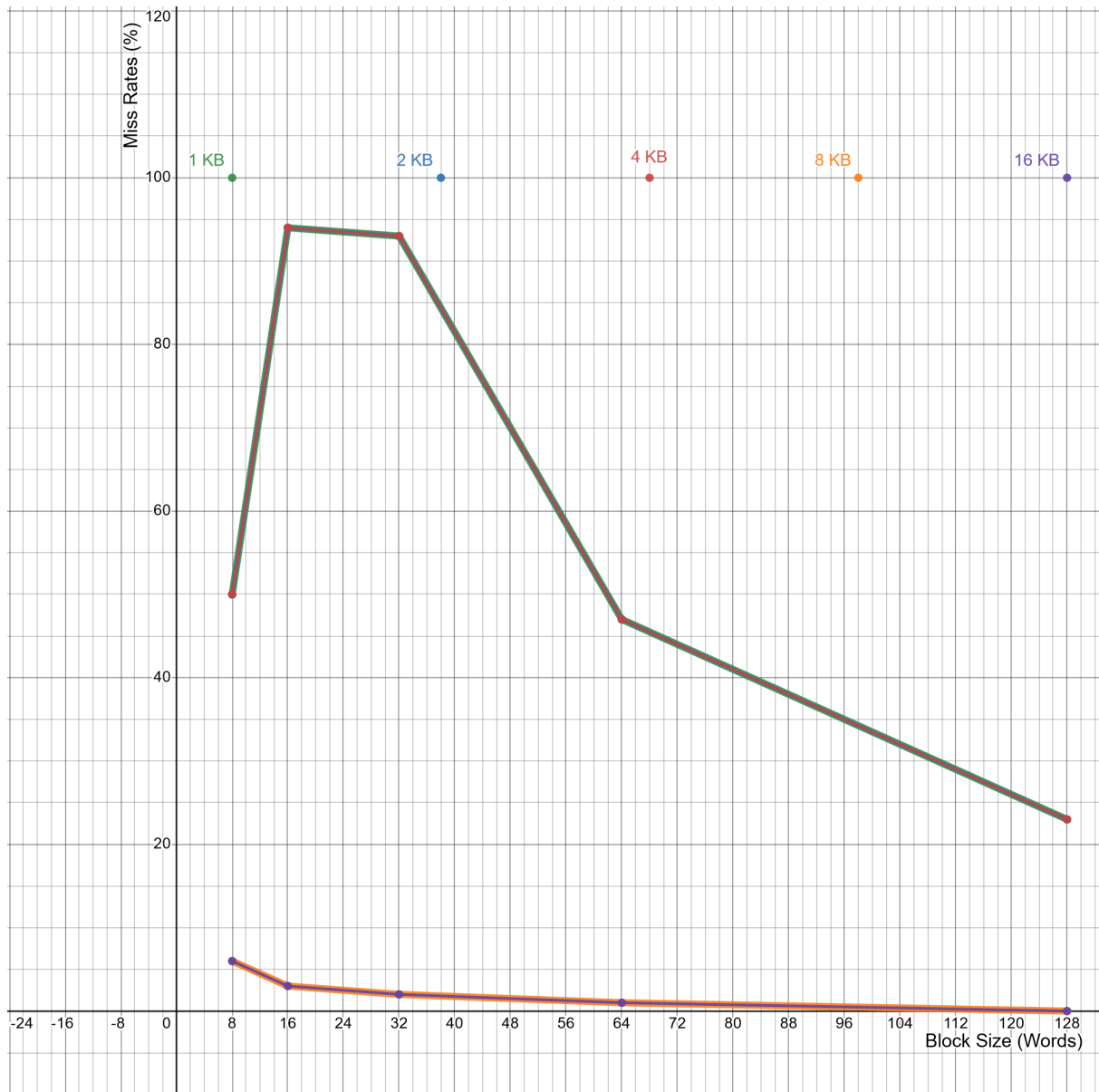
Graph 3: Direct Mapped Cache - Row Major Summation Miss Rates (N = 64)

2.a (N = 64)

Block Size (Words)	8	16	32	64	128
Cache Size (Kilobytes)					
1 KB	Miss Rate %50 Miss Number 4111	Miss Rate %94 Miss Number 4107	Miss Rate %93 Miss Number 4104	Miss Rate %47 Miss Number 2054	Miss Rate %23 Miss Number 1030
2 KB	Miss Rate %50 Miss Number 4111	Miss Rate %94 Miss Number 4107	Miss Rate %93 Miss Number 4104	Miss Rate %47 Miss Number 2054	Miss Rate %23 Miss Number 1029
4 KB	Miss Rate %50 Miss Number 4111	Miss Rate %94 Miss Number 4107	Miss Rate %93 Miss Number 4104	Miss Rate %47 Miss Number 2054	Miss Rate %23 Miss Number 1029
8 KB	Miss Rate %6 Miss Number 271	Miss Rate %3 Miss Number 139	Miss Rate %2 Miss Number 72	Miss Rate %1 Miss Number 38	Miss Rate %0 Miss Number 21
16 KB	Miss Rate %6 Miss Number 270	Miss Rate %3 Miss Number 138	Miss Rate %2 Miss Number 71	Miss Rate %1 Miss Number 37	Miss Rate %0 Miss Number 20

Table 6: Direct Mapped Cache - Column Major Summation Miss Rates (N = 64)

2.a (N = 64)



Graph 4: Direct Mapped Cache - Column Major Summation Miss Rates (N = 64)

2.b (N = 64)

	Hit Rate: Good Cache Size: 16 KB Block Size: 64 Words	Hit Rate: Medium Cache Size: 4 KB Block Size: 8 Words	Hit Rate: Poor Cache Size: 4 KB Block Size: 16 Words
Direct Mapped	Miss Rate: %1 Miss Number: 37	Miss Rate: %50 Miss Number: 4111	Miss Rate: %94 Miss Number: 4107
Fully Associative (LRU)	Miss Rate: %1 Miss Number: 36	Miss Rate: %6 Miss Number: 271	Miss Rate: %3 Miss Number: 139
Fully Associative (Random)	Miss Rate: %1 Miss Number: 36	Miss Rate: %8 Miss Number: 331	Miss Rate: %9 Miss Number: 394

Table 7: Column Major Summation Miss Rates with Cache Designs (N = 64)

2.c (N = 64)

	Hit Rate: Good Cache Size: 16 KB Block Size: 64 Words	Hit Rate: Medium Cache Size: 4 KB Block Size: 8 Words	Hit Rate: Poor Cache Size: 4 KB Block Size: 16 Words
Set Size			
8	Miss Rate: %1 Miss Number: 36	Miss Rate: %94 Miss Number: 4111	Miss Rate: %94 Miss Number: 4107
16	Miss Rate: %1 Miss Number: 36	Miss Rate: %94 Miss Number: 4111	Miss Rate: %94 Miss Number: 4107
32	Miss Rate: %1 Miss Number: 36	Miss Rate: %94 Miss Number: 4111	Miss Rate: %94 Miss Number: 4107

Table 8: Column Major Summation Miss Rates for N-Way Caches (N = 64)